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Domain-Specific Languages: What, Why, How

Charles Consel [1]

INRIA/LaBRI,
Ecole Nationale Supérieure d'Electronique, Informatique et Radiocommunications de Bordeaux,
1, avenue du docteur Albert Schweitzer,
Domaine universitaire - BP 99,
F-33402 Talence Cedex, France

Abstract

Domain-specific languages (DSLs) are being increasingly used as a realistic approach to address a program family. That is, a set of programs that shares enough commonalities to be considered as a whole. These programs may already exist or be expected to be developed. In this situation, in principle, software development can benefit from introducing a DSL in that (1) it offers concise and specific notations to express a member of the program family, and (2) it enables the development of safe code thanks to its restricted semantics and/or requirements for additional information.

The Compose group has developed DSLs for various domains such as device drivers, active networking, and process scheduling, and built some experience in designing and implementing DSLs. In this talk we will report on the outcomes of this line of work. In particular, we will attempt to provide a practical definition of a DSL, and give the conditions to make this approach successful. We will discuss actual benefits of the DSL approach. Finally, we will outline a methodology to design and implement a DSL.

[1] Email: consel@labri.fr